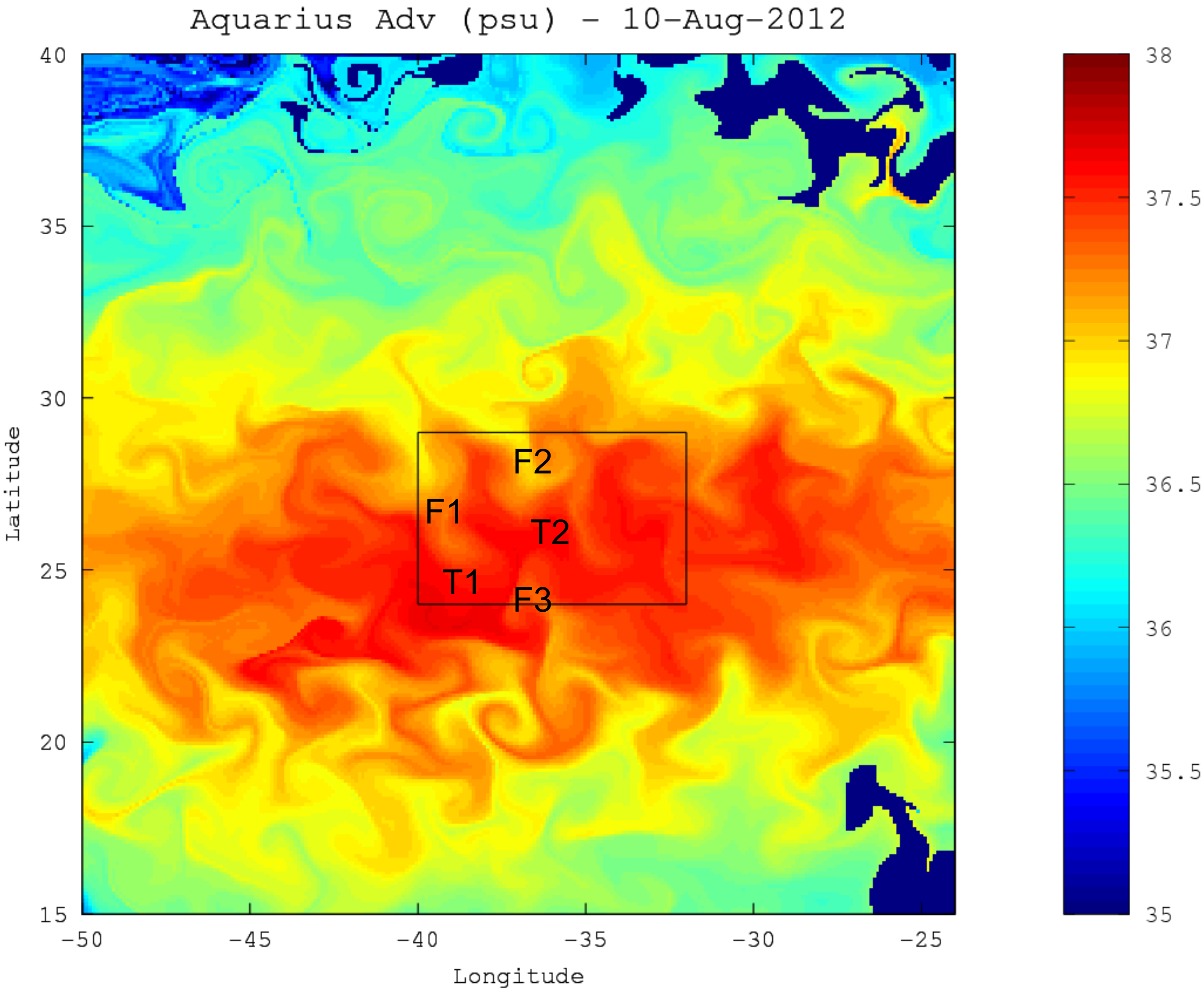
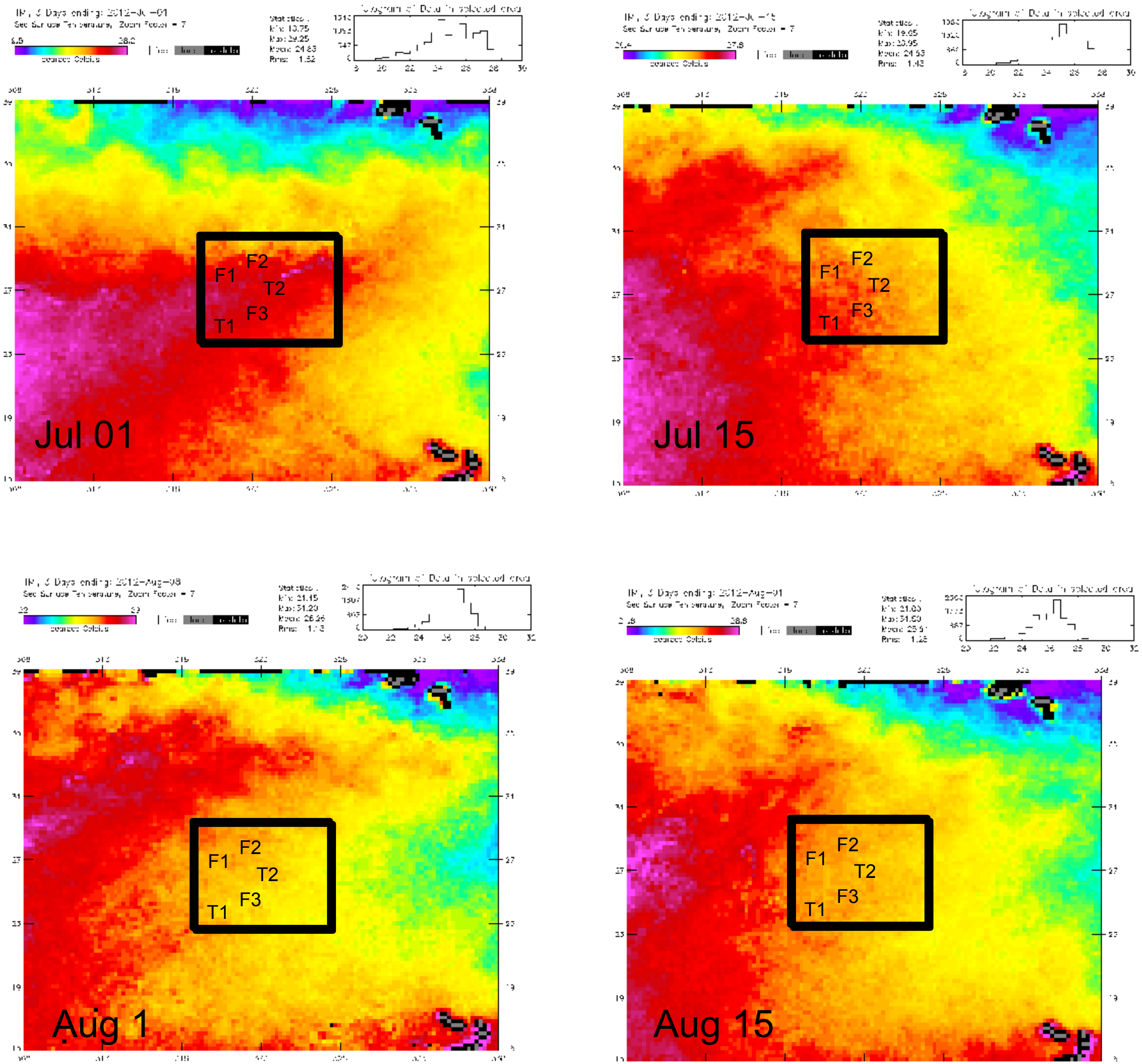
SUMMARY

We tried to define from multisatellite+mercator data the center of the gyre as the most dynamically stable region where a salinity budget can be closed. We looked for regions where salinity is highest, lateral intrusion is minimal, chlorophyll minimal, large-scale temperature gradient flattest, and most of remote sensing+Mercator analyses are coherent and stable on a timescale of a few weeks. We found two targets T1 (38:40W 24:25.5N) and T2 (35.5:36.5W 25.5:27N).
There are three filamentation regions (F1, F2, F3) which likely control lateral mixing into T1 and T2 and which would be useful to survey (especially F3) but probably not concentrate all the campaign inside, since are quite dynamic. All structures drift slowly to W with a speed of 100-200 km/month. The structures are plotted over advected Aquarius data. The other products are discussed in the next slides.

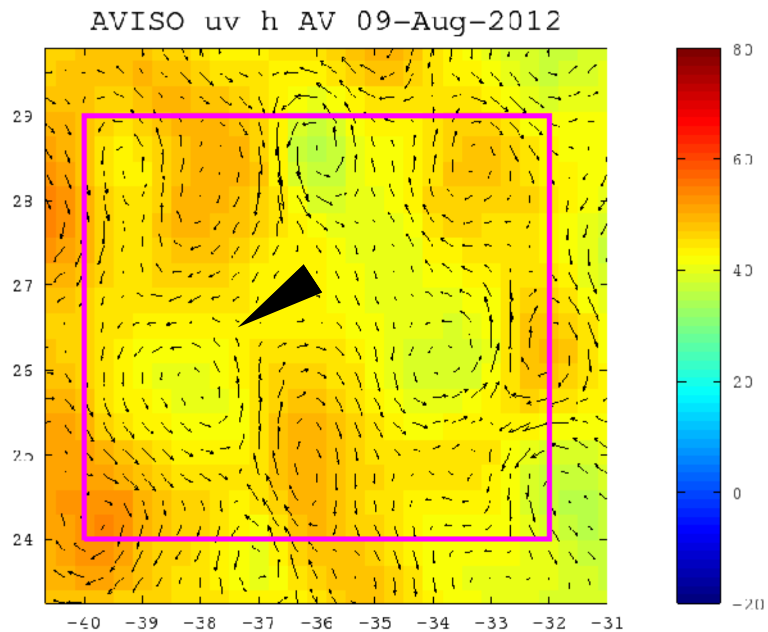
Note: we have placed the T's and F's labels by hand. So their positions on the maps are only approximative!

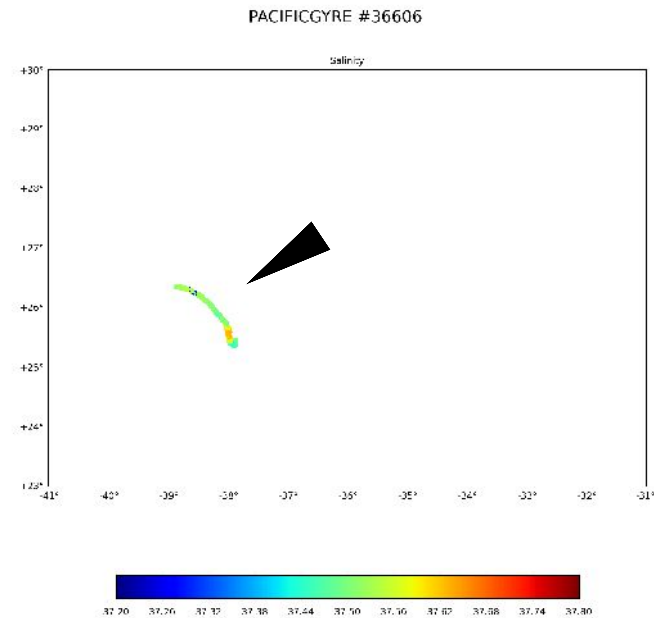


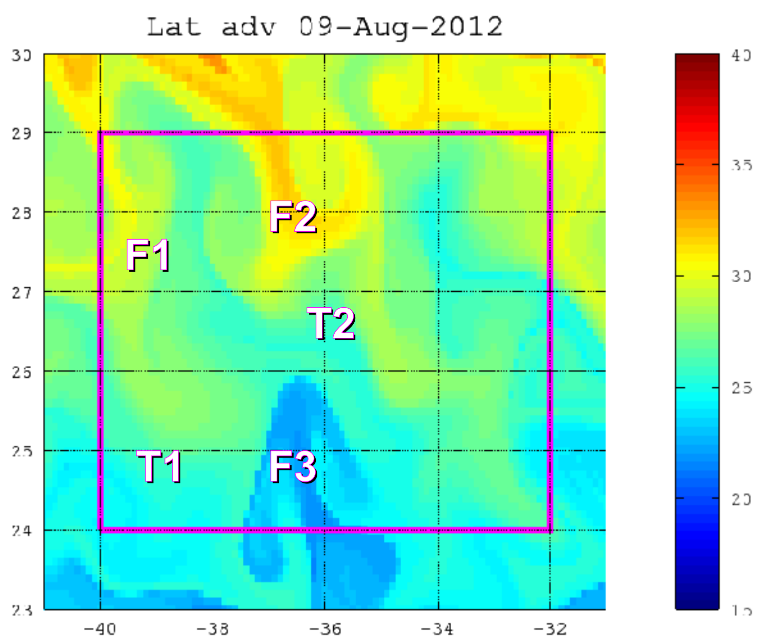


TMI SST

In order to identify the large-scale (~100 km, weeks to month) structure of the gyre we looked at microwave SST data from TMI. In the T1-T2 region SST gradient is relatively flat. The large-scale anti-cyclonic circulation of the gyre is evident, and intrusion of warm water from the west and cold water from the east into T1-T2 region can be expected. These intrusions can be driven by lateral stirring as well as wind and will contribute to the salinity budget as well. These intrusions are quite evident in the altimetry analysis and it would be useful to validate them with a short survey if possible. The position of region with a flat SST gradient and the large-scale structure of the gyre have been relatively stable over 1 month.







ALTIMETRY

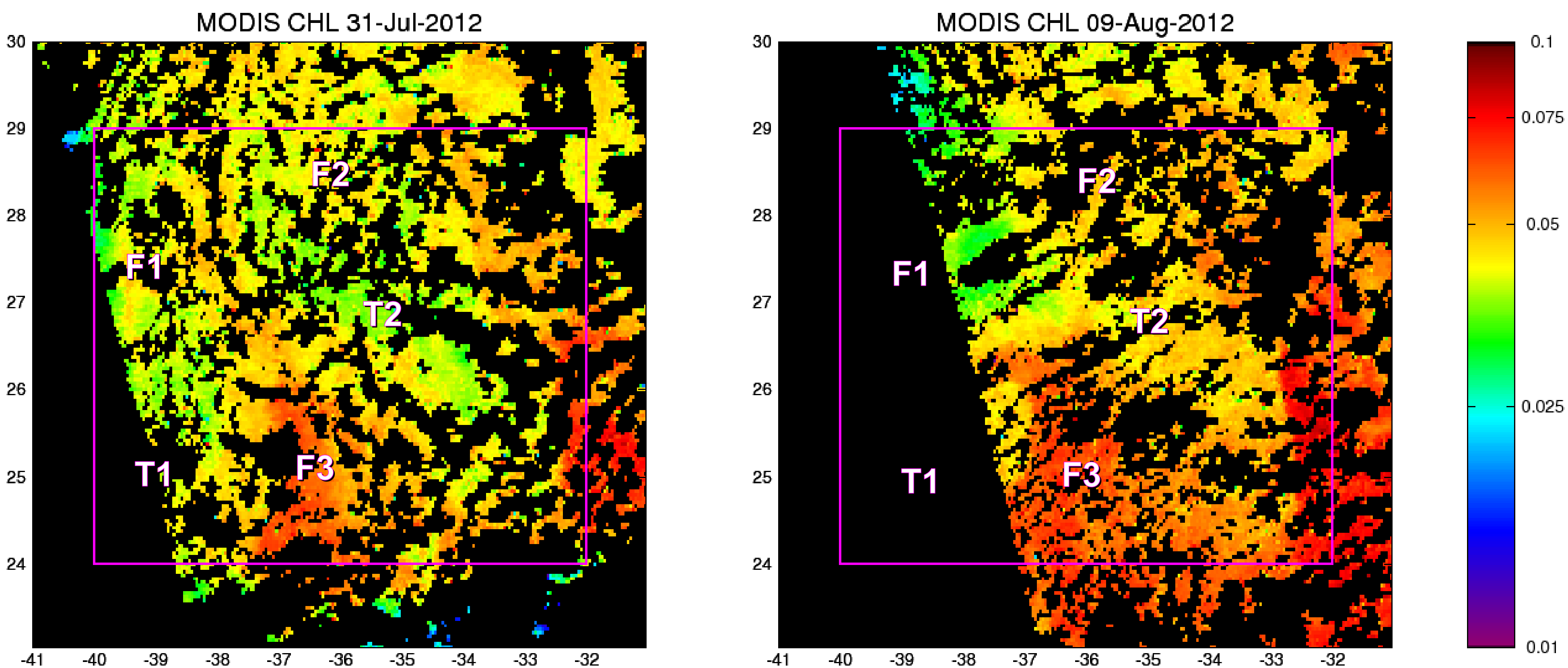
The altimetry-based Lagrangian analysis describes the horizontal stirring and identify three filamentation regions which control mixing of T1-T2 waters with ambient waters. Are the position of these filaments reliable? What is their vertical structure? A few transects crossing one or more of the fronts induced by these filaments (and maybe shallow CTD casts on the two sides of the fronts) will help to estimate the reliability of altimetry-derived estimations of stirring in this region and how to integrate its effect on the salinity budget. The drifter trajectory is very short, but coherent with an altimetry-detected eddy.

Chlorophyll

The altimetry-derived structure of T1 and T2 and F1-3 shows Chl minima in T1-2 and higher Chl values for F1-3. Although the contrast of chl values in these T and F regions is low and at the limit of modis resolution, it is consistent with very oligotrophic surface waters in the center of the gyre and slightly more productive waters intruding through F1-3 from the gyre periphery.

The intrusion along F3 appears to be the more dynamically stable of the three as it is visible in both images, as well as in agreement with the drifter trajectory.

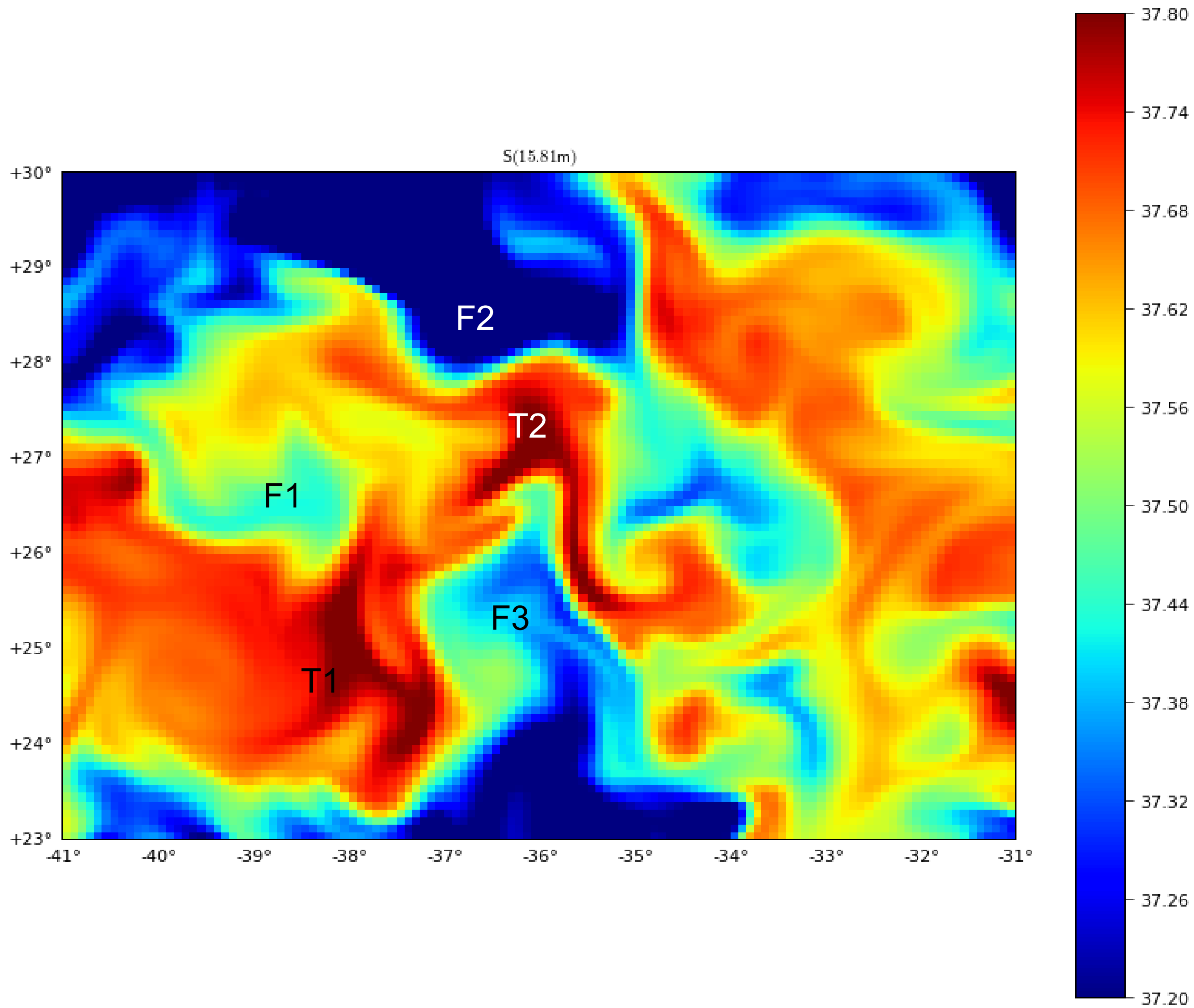
A transect from T2 to F3 crossing the front at 26.5N 36W could help to more accurately localize the position of the front as well as to characterize the 3D dimensional (especially vertical) dynamics of the (sub-)mesoscale mixing between T2 and the southwestern waters.



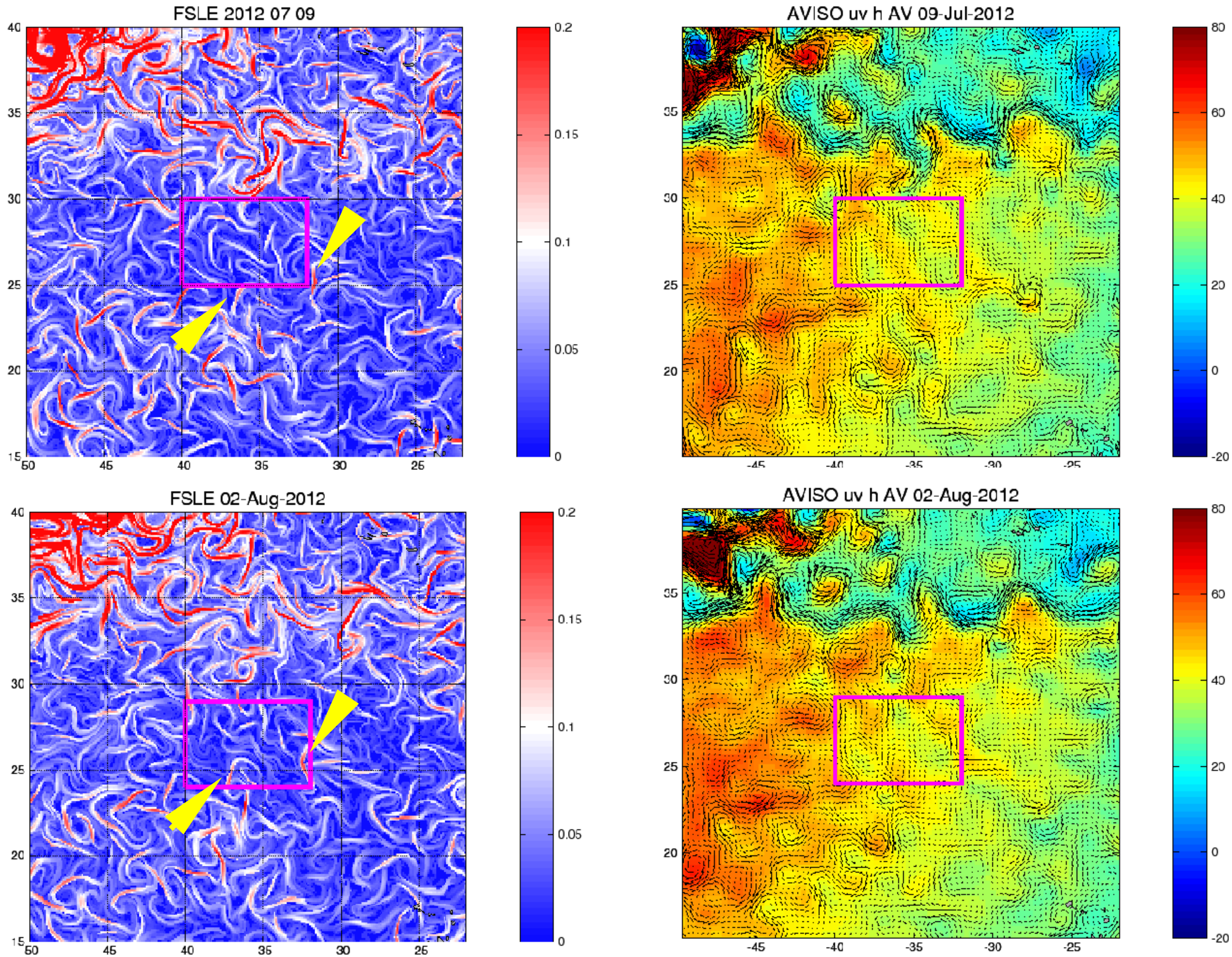
MERCATOR

The filamentation of the salinity maximum and the position of its lobes T1 and T2 are in good qualitative agreement between MERCATOR and advected AQUARIUS data.
The most noticeable difference is that F3 penetrates deeper to the North and displaces T2 one degree further north.

MERCATOR : ext-mercatorpsy2v4r2_ham_mean_20120731_R20120808.nc



Temporal evolution of altimetry derived structures



Temporal evolution of altimetry derived structures